

## Medium recipe

Potassium minimal medium recipes we used were adopted from the paper “Potassium Transport Loci in Escherichia coli K-12” (Esptein, 1971). To prepare minimal medium of different potassium concentration with the same osmolality, K115 and K0 minimal medium were prepared first, with potassium concentration of 115mM and 0mM accordingly. Then other concentrations of media were prepared by mixing the two with the desired ratio. Noticeably, media concentration lower than 0.02 mM may be prepared by series dilution of K10 minimal medium ( $[K^+]=10\text{ mM}$ ) with K0 medium. Kanamycin (50  $\mu\text{g/ml}$ ) for plasmid selection were added as needed.

### 115 mM K minimal medium (K115 minimal medium)

Reagents	Working concentration
$\text{K}_2\text{HPO}_4$	46 mM
$\text{KH}_2\text{PO}_4$	23 mM
$(\text{NH}_4)_2\text{SO}_4$	8 mM
$\text{MgSO}_4$	0.4 mM
$\text{FeSO}_4$	6 $\mu\text{M}$
Citric acid*	0.66 mM
Tri-sodium citrate	0.33 mM
Thiamine hydrochloride	1 mg/liter
Glucose	2 g/liter.
Casein acid hydrolysate <sup>#</sup>	0.2%

### 0 mM K minimal medium (K0 minimal medium)

Reagents	Working concentration
$\text{Na}_2\text{HPO}_4$	46 mM
$\text{NaH}_2\text{PO}_4$	23 mM
$(\text{NH}_4)_2\text{SO}_4$	8 mM
$\text{MgSO}_4$	0.4 mM
$\text{FeSO}_4$	6 $\mu\text{M}$
Citric acid*	0.66 mM
Tri-sodium citrate dehydrate*	0.33 mM

Thiamine hydrochloride	1 mg/liter
Glucose	2 g/liter.
Casein acid hydrolysate <sup>#</sup>	0.2%

\* One milli-mole mono-sodium citrate was stated in the original minimal medium recipe.

# DH10B requires leucine for growth on minimal medium due to the deletion of *leuLABCD*.  
Casein acid hydrolysate is used as supplement to support the growth.